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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,037	09/09/2003	Takami Eguchi	CFA 00005 US (MOI 400-214	3289

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Canon U.S.A. Inc.
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EXAMINER	
BITAR, NANCY	

ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 11/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/659,037	EGUCHI ET AL.	
	Examiner	Art Unit	
	Nancy Bitar	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *07/14/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The title should mention the distinctive feature(s) of the claimed invention

Claim Rejections - 35 U.S.C. § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

3. Claims 10-11, and 14-15 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The recitation claim 10 and 14 of "repetition number of embedding the digital-watermark " is unclear, because no such number is defined or previously recited in claims 1-9. Because no "repetition number" are defined by or recited in the preceding claim language, it is unclear what feature or element this claim language, is further defining, so that the claim fails to clearly point out and distinctly claim applicant's invention. Claims 11 and 15 are variously dependent from claim 10 and 14 respectively, and are thus similarly indefinite.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.
>
> When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).
>
> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

5. Claim 18 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 18 defines a" storage medium" embodying functional descriptive material. However, the claim does not define a computer-readable medium or memory and is thus non-statutory for that reason (i.e.,

"When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). That is, the scope of the presently claimed " a storage medium" can range from paper on which the program is written, to a program simply contemplated and memorized by a person. The examiner suggests amending the claim to embody the program on "computer-readable medium" or equivalent in order to make the claim statutory. Any amendment to the claim should be commensurate with its corresponding disclosure.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katsura et al (US 6,898,297) in view of Alturki et al (An obvious Robust Digital Watermark Technique for Still images using DCT phase modulation, 2000 IEEE) and further in view of Horino et al (US 5,861,619).

As to claim 1, Katsura teaches a digital-watermark embedding method (digital watermark embedding method, column 1, lines 9-10) comprising: a generating step of

generating digital-watermark information; an input step of inputting an image (an embedding data input means 1 inputs embedding data to be imbedded as a digital watermark into image data, column 5, lines 37-39)) a setting step (control means 9) of setting a first parameter determining robustness to attack on the digital-watermark information embedded in the image and a second parameter determining quality of the image in which the digital-watermark information is embedded (column 6, lines 50-57)); Katsura teaches an embedding step (embedding means 6) of embedding the digital-watermark information in the input image by using the first and second parameters (column 6, lines 23-30); a determination step of determining whether or not the entire digital-watermark information can be embedded in the image (real information detecting means, 15). Moreover, Katsura teaches an update step (compression/modulation means, 7) of updating one of the parameters so as to embed a larger amount of digital-watermark information in the image when it is determined that the entire digital-watermark information cannot be embedded in the determination step (the extension/demodulation means 14 extends and demodulates the information read by the pick up portion 13 and output the embedded image data to a real embedding information detecting means 15, note that the real embedding information is excluded from the embedded data, column 6, lines 59-67) , the update step being performed as a first stage; and an embedding step of embedding the digital-watermark information in the input image again by using the updated parameter(outputs the embedded image data to an image signal output means 21, column 6, lines 59-66), wherein the determination step is performed for each of the embedding steps(information detecting

means 15). While Katsura meets a number of the limitations of the claimed invention, as pointed out more fully above, Katsura fails to specifically teach the setting a first parameter determining robustness to attack on the digital-watermark information embedded in the image and a second parameter determining quality of the image in which the digital-watermark information is embedded. Specifically, Alturki et al. teaches the control of maintaining a balance between robustness and the perceptual quality of the image where the higher the magnitude of the DCT coefficient selected the higher the robustness of this coefficient to image processing operation. However, high DCT coefficients are perceptually the most important coefficients in the image. By changing these coefficients we run the risk of changing the perceptual quality of the image. Therefore, we must select these coefficients in an adaptive way. We select the highest coefficients and modulate them. If the image quality is degraded, we back off and select coefficients with smaller values and test the perceptual quality of the image again, note that the watermark location of the selected coefficient must be known to the user; column 2, page 1976). Because the use of control unit to apply the DCT in order to balance the quality and robustness attack of an image. It would have been obvious to one of ordinary skill in the art to apply the DCT in Katsura control unit in order to determine the exact location for all pixels, hence improve the watermark detection process, hence improving the quality of an image. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 2, Katsura teaches a method according to claim 1, further comprising: an update step (compression/modulation means, 7, step 5) of updating the second parameter so as to degrade the image quality when it is determined that the entire digital-watermark information cannot be embedded in the determination step (step 11; note that Alturki teaches We further try to maximize the magnitude of the selected coefficients so that if there is any attempt to embed another watermark, the perceptual quality of the image will start to deteriorate), the update step being performed as a first stage; and an embedding step of embedding the digital-watermark information in the input image again by using the first parameter and the updated second parameter (The resulting watermarked image is x'(n1,n2), see Alturki et al: page 1976)

As to claims 3 and 4, Katsura teaches an update step of updating the first parameter so as to degrade the robustness when it is determined that the entire digital-watermark information cannot be embedded in the determination step (step 11) and when the degradation of the image quality and robustness reaches a first threshold value the update step being performed as a second stage (if the error rate exceeds the threshold, the falsification judgment means 20 judges that a falsification exists the judgment result is returned to the control means 9, column 7, lines 40-44), and an embedding step(step 4, column 7,lines 53-54) of embedding the digital-watermark information in the input image again by using the updated first parameter and the second parameter(note that the compression/modulation means 7 compresses and modulates the result, and thereafter the pickup portion 13 stores data, column 7, lines 55-58).

As to claims 5 -7, Katsura teaches a method according to claim 1, further comprising: an update step (step 5 using the compression/modulation means 7) of updating the first parameter so as to degrade the robustness and quality when it is determined that the entire digital-watermark information cannot be embedded in the determination step (note Alturki et al teaches maintaining a balance between robustness and the perceptual quality of the image, page 1976) the update step being performed as a first stage (step 11, the real embedding information detection means 15 extracts real embedding information, column 7, lines 64-66),; and an embedding step of embedding the digital-watermark information in the input image again by using the updated first parameter and the second parameter(in step 4 the real embedding means 6 embeds the real information, column 7, lines 52-53).

As to claims 8 and 9, while Katsura meets a number of the limitations of the claimed invention, as pointed out more fully above, Katsura fails to specifically the digital-watermark information is embedded in the image by rotating the letters so as to change the inclination angle of the letters and the second parameter specifies the range of rotation angle of the letters. Specifically, Horino et al. teaches deforming the font of a specific letter or character on the basis of signature information to be embedded, column 1, lines 47-49). Moreover, Alturki clearly teaches the parameter of an image is based on a balance between robustness and the perceptual quality of the image. Because the encoder converts signature data into bits that includes letters that is embedded into electronic data and maintains the same quality. It would have been obvious to one of ordinary skill in the art to apply the embedding step of characters in

Katsura image data where the use of Alturki control unit to adjust the perceptual quality and robustness of the image in order to provide an improved method of coding an electronic text document which is not easily discernible to an unauthorized entity, thus decreasing the chance of theft and piracy of intellectual property. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 10, Horino teaches a method according to claim 8, wherein the first parameter specifies the repetition number of embedding the digital-watermark information in the image (column 5, lines 30-35; note that the first parameter corresponds to the repetition number or the error-correction ability).

As to claim 11, Katsura teaches a method according to claim 8, wherein the digital-watermark information is encoded with an error-correction code (error correction means, 16), and the first parameter specifies the error-correction ability of the encoded digital-watermark information (Based on the real embedding information that has undergone error correction by the error correction means 16, a majority decision means 18 executes a majority decision regarding each corresponding bit of the information bit, and makes an error correction according to the majority decision. At this time, the majority decision means 18 calculates an error rate, and stores the obtained error rate in a second area of the error rate record means 17 as a second error rate, column 7, lines 17-24)

As to claim 12,Horino teaches a method according to claim 1, wherein a plurality of letters are included in the image, and, in the embedding step, the digital-watermark information is embedded in the image by changing the positions of the letters so as to adjust spaces between the letters (the length of a space preceding a word in a line of text data of an electronic document relative to the length of a space following the word is modulated with the value of a bit of signature data, column 1, lines 64-67).

As to claim 13, Horino teaches a method according to claim 12, wherein the second parameter specifies the range of movement of the letters (figure 3, the position of word 2i is determined with respect to a reference position 55, which may be the left edge of sheet 5, column 4, lines 52-53).

As to claim 14, Horino teaches a method according to claim 12, wherein the first parameter specifies the repetition number of embedding the digital-watermark information in the image (column 5, lines 30-35; note that the first parameter corresponds to the repetition number or the error-correction ability).

As to claim 15, Katsura teaches a method according to claim 8, wherein the digital-watermark information is encoded with an error-correction code (error correction means, 16), and the first parameter specifies the error-correction ability of the encoded digital-watermark information (Based on the real embedding information that has undergone error correction by the error correction means 16, a majority decision means 18 executes a majority decision regarding each corresponding bit of the information bit, and makes an error correction according to the majority decision. At this time, the

majority decision means 18 calculates an error rate, and stores the obtained error rate in a second area of the error rate record means 17 as a second error rate, column 7, lines 17-24)

As to claim 16, Katsura teaches a method according to claim 1, wherein the both parameters are updated so as to embed a larger amount of digital-watermark information in the image (step 5 using the compression/modulation means 7) when it is determined that the entire digital-watermark information cannot be embedded in the determination step, the update step being performed as a first stage (column 7, lines 40-45).

Claim 17 differ from claim 1 only in that claim 17 is an apparatus claim whereas; claim 1 is a method claim. Thus, claim 17 is analyzed as previously discussed with respect to claim 1 above.

Claim 18 differ from claim 1 only in that claim 18 is a program claim whereas; claim 1 is a method claim. Thus, claim 18 is analyzed as previously discussed with respect to claim 1 above.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Katsura et al (US 6,898,297) is cited to teach embedding data to be embedded as a digital watermark is acquired. Packing data is formed in which the embedding data

is repeatedly connected three times or more sequentially without interval. Real embedding information is formed such that a redundancy bit with a fixed length that is used for an error correction of an information bit is added immediately after the information bit in which the packing data is subdivided into data each having a fixed length. The real embedding information is embedded into the image data itself. The embedding mechanism for the information is not easily understood, and security level is high.

Nakamura et al (US 6,246,775) is cited to teach An apparatus for superposing a digital watermark for superposing digital watermark information on an information data signal bearing original information, superposes digital watermark information on an information data signal bearing original information, for each unit block consisting of a group of pieces of information data.

Inquiries

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nancy Bitar whose telephone number is 571-270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on 571-272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nancy Bitar 11/08/2006

JOSEPH MANCUSO
SUPERVISORY PATENT EXAMINER